

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An image processing apparatus for generating scaled image data that is obtained by scaling the image data according to a specified scaling factor, the image processing apparatus comprising:

an image data input section that receives input of image data described in a page description language;

a page description language processing section that converts the page description language input image data;

a receiver that receives an input of pixel value information of each pixel which is contained in the converted image data to be processed in raster scan order;

a first memory that stores the pixel value information input in the raster scan order, ~~the~~ a maximum capacity of the first memory being less than a memory capacity needed to store the pixel image data of a full scanning line in a main scanning direction; ~~direction width of the image data~~

a second memory that retains the scaled image data of an entire scanning line's worth of pixel data as much as the main scanning direction width relative to a main scanning direction and at least a part of and the scaled image data of a plurality of subscanning lines relative to a subscanning direction;

a destination address generator that generates destination address information in the second memory to specify a destination location of the pixel value information stored in the first memory in response to the specified scaling factor; and

a transferring unit that transfers the pixel value information from the first memory to the second memory based on the generated destination address information.

2. (Currently Amended) An image processing apparatus for generating scaled image data that is obtained by scaling the image data according to a specified scaling factor, the image processing apparatus comprising:

an image data input section that receives input of image data described in a page description language;

a page description language processing section that converts the page description language input image data;

a receiver that receives an input of pixel value information of each pixel which is contained in the converted image data to be processed in raster scan order;

a first memory that stores the pixel value information input in the raster scan order, ~~the~~ a maximum capacity of the first memory being less than a memory capacity needed to store the pixel image data of a full scanning line in a main scanning direction; ~~direction width of the image data~~

a second memory that retains the scaled image data of an entire scanning line's worth of pixel data as much as the main scanning direction width relative to a main scanning direction and at least a part of and the scaled image data of a plurality of subscanning lines relative to a subscanning direction;

a source address generating unit that generates a source address information in the first memory that stores the pixel value information to be retained in each address in the second memory based on an address shift amount determined in response to the specified scaling factor; and

a transferring unit that transfers the pixel value information from the first memory to the second memory based on the generated source address information.

3. (Original) The image processing apparatus as claimed in claim 1 further comprising:

a dividing unit that divides the image data into pixel blocks of a size defined based on the capacity of the first memory, wherein

the first memory stores the pixel value information contained in the divided pixel block.

4. (Original) The image processing apparatus as claimed in claim 2 further comprising:

a dividing unit that divides the image data into pixel blocks of a size defined based on the capacity of the first memory, wherein

the first memory stores the pixel value information contained in the divided pixel block.

5. (Original) The image processing apparatus as claimed in claim 2, wherein the source address generating unit generates the source address using an offset value;

the offset value is provided based on a cumulative addition calculation of the address shift amount; and

the source address generating unit includes:

a retaining unit that retains at least a decimal place of the offset value at a point after the pixel value information is transferred.

6. (Original) The image processing apparatus as claimed in claim 2, wherein the source address generating unit generates the source addresses using respective offset values relative to the main scanning direction and the subscanning direction;

the respective offset values are provided by performing a cumulative addition calculation of the address shift amounts responsive to the scaling factor in the main scanning direction and that in the subscanning direction; and

the source address generating unit includes:

a first retaining unit that retains at least a decimal place of the offset value relative to the main scanning direction at a point after the pixel value information is transferred; and

a second retaining unit that retains at least a decimal place of the offset value relative to the subscanning direction.

7. (Original) The image processing apparatus as claimed in claim 5,
wherein the source address generating unit further includes:

an initial value retaining unit that retains at least the decimal place of the offset value at the point when the pixel value information has been transferred as much as a capacity of the second memory as an initial value of a next source address calculation, if the second memory cannot retain the pixel value information as much as the subscanning direction width of the scaled image data.

8. (Original) The image processing apparatus as claimed in claim 5,
wherein the address shift amount is a reciprocal of the specified scaling factor;

and

the source address generating unit updates the offset value by adding the address shift amount to the current offset value, and increments the source address by one if the updated offset value becomes one or more.

9. (Original) The image processing apparatus as claimed in claim 6,
wherein the address shift amount is a reciprocal of the specified scaling factor;

and

the source address generating unit updates the offset value by adding the address shift amount to the current offset value, and increments the source address by one if the updated offset value becomes one or more.

10. (Original) The image processing apparatus as claimed in claim 7,
wherein the address shift amount is a reciprocal of the specified scaling factor;
and

the source address generating unit updates the offset value by adding the
address shift amount to the current offset value, and increments the source address by one if
the updated offset value becomes one or more.

11. (Original) The image processing apparatus as claimed in claim 7,
wherein the address shift amount is a reciprocal of the specified scaling factor;
and

the source address generating unit updates the offset value by adding the
address shift amount to the current offset value, increments the source address by one if the
updated offset value becomes one or more, refers to a location of the pixel value information
stored in the first memory on the image data to be processed, and sets the offset value to the
initial value retained in the initial value retaining unit if the location satisfies a predetermined
condition.

12. (Currently Amended) An image processing method for generating scaled
image data that is obtained by scaling the image data according to a specified scaling factor,
the image processing method comprising:

receiving input of image data described in a page description language;
converting the page description language input image data;
receiving an input of pixel value information of each pixel which is contained
in the converted image data to be processed in raster scan order;

storing the pixel value information input in the raster scan order in a first
memory, a maximum capacity of the first memory being less than a memory capacity needed

to store the pixel image data of a full scanning line in a main scanning direction;~~direction width of the image data;~~

generating destination address information in the second memory to specify a destination location of the pixel value information stored in the first memory in response to the specified scaling factor, wherein the second memory retains the scaled image data of an entire scanning line's worth of pixel data as much as the main scanning direction width~~relative to a main scanning direction and at least a part of~~ and the scaled image data of a plurality of subscanning lines relative to a subscanning direction; and

transferring the pixel value information from the first memory to a second memory based on the generated destination address information.

13. (Currently Amended) An image processing method for generating scaled image data that is obtained by scaling the image data according to a specified scaling factor, the image processing method comprising:

receiving input of image data described in a page description language;

converting the page description language input image data;

receiving an input of pixel value information of each pixel which is contained in the converted image data to be processed in raster scan order;

storing the pixel value information input in the raster scan order in a first memory, a maximum capacity of the first memory being less than the a memory capacity needed to store the pixel image data of a full scanning line in a main scanning direction;~~direction width of the image data;~~

generating a source address information in the first memory that stores the pixel value information to be retained in each address in the second memory, that retains the scaled image data of an entire scanning line's worth of pixel data as much as the main scanning direction width~~relative to a main scanning direction and at least a part of~~ and the

scaled image data of a plurality of subscanning lines relative to a subscanning direction, based on an address shift amount determined in response to the specified scaling factor; and

transferring the pixel value information from the first memory to a second memory based on the generated source address information.

14. (Currently Amended) A computer-readable medium comprising an image processing program which, when executed by a computer, cause the computer to perform an image processing method comprising:

receiving input of image data described in a page description language;

converting the page description language input image data;

receiving an input of pixel value information of each pixel which is contained in the converted image data to be processed in raster scan order;

storing the pixel value information input in the raster scan order in a first memory, a maximum capacity of the first memory being less than a memory capacity needed to store the pixel image data of a full scanning line in a main scanning direction; ~~direction~~ ~~width of the image data;~~

generating destination address information in the second memory to specify a destination location of the pixel value information stored in the first memory in response to the specified scaling factor, wherein the second memory retains the scaled image data of an entire scanning line's worth of pixel data as much as the main scanning direction width ~~relative to a main scanning direction and at least a part of~~ and the scaled image data of a plurality of subscanning lines relative to a subscanning direction; and

transferring the pixel value information from the first memory to a second memory based on the generated destination address information.

15. (Currently Amended) A computer-readable medium comprising an image processing program which, when executed by a computer, cause the computer to perform an image processing program comprising:

receiving input of image data described in a page description language;

converting the page description language input image data;

receiving an input of pixel value information of each pixel which is contained in the converted image data to be processed in raster scan order;

storing the pixel value information input in the raster scan order in a first memory, a maximum capacity of the first memory being less than the a memory capacity needed to store the pixel image data of a full scanning line in a main scanning direction;
~~direction width of the image data;~~

generating a source address information in the first memory that stores the pixel value information to be retained in each address in the second memory, that retains the scaled image data of an entire scanning line's worth of pixel data as much as the main scanning direction width relative to a main scanning direction and at least a part of and the scaled image data of a plurality of subscanning lines relative to a subscanning direction, based on an address shift amount determined in response to the specified scaling factor; and

transferring the pixel value information from the first memory to a second memory based on the generated source address information.

16. (New) The image processing apparatus as claimed in claim 1 further comprising a dividing unit that divides the image data into a pixel block of a size of the maximum capacity of the first memory,

wherein the destination address generator generates the destination address information in the subscanning direction of the pixel block, after the destination address

generator generates the destination address information of the main scanning direction width of the pixel block in response to the specified scaling factor.

17. (New) The image processing method as claimed in claim 12 further comprising dividing the image data into a pixel block of a size of the maximum capacity of the first memory,

wherein the destination address information in the subscanning direction of the pixel block is generated, after generating the destination address information of the main scanning direction width of the pixel block in response to the specified scaling factor.

18. (New) The computer-readable medium comprising the image processing program as claimed in claim 14, the image processing program which, when executed by the computer, cause the computer to perform an image processing method further comprising dividing the image data into a pixel block of a size of the maximum capacity of the first memory,

wherein the destination address information in the subscanning direction of the pixel block is generated, after generating the destination address information of the main scanning direction width of the pixel block in response to the specified scaling factor.